



Figure 1. Transverse T1-weighted SE image obtained after intravenous injection of contrast material shows a central dark, non-enhanced area inside the right enlarged quadriceps muscle with surrounding enhancement. Linear enhanced signal infiltrates (arrows) are present through the dark core and tissue planes are preserved. R=right

could arise coincidentally in the baby of a mother with diabetes.

In this particular case, the mother had experienced recurrent severe hypoglycaemia during early pregnancy which could have been of importance.

The increase in perinatal morbidity and mortality in diabetic pregnancy is well known and has been shown to be associated with maternal hyperglycaemia.<sup>2</sup> Evidence that maternal hypoglycaemia may cause human fetal lesions is scarce. In a review of eight pregnant women who were subjected to insulin-induced hypoglycaemic comas for treatment of psychiatric diseases it was found that two delivered normal children, four macerated fetuses, and two mentally retarded children of whom one had skeletal skull anomalies and atrophy of the optic nerve.<sup>3</sup> In animal experimentation, pharmacological doses of insulin administered to pregnant animals were associated with fetal structural damage and increased fetal resorption rate.<sup>4,5</sup> Preventing the hypoglycaemia in the insulin-treated rats normalized embryonic development and *in vitro* addition of pharmacological doses of insulin to normoglycaemic serum did not cause malformations in the cultured embryos.<sup>6</sup>

These data do raise the possibility that severe recurrent hypoglycaemia may be toxic to fetal development.

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#### References

1. Noonan JA, Ehmke DA. Associated noncardiac malformations in children with congenital heart disease. *J Pediatr* 1963; **63**: 468–470.
2. Hansson U, Persson B, Thunell S. Relationship between haemoglobin A<sub>1c</sub> in early Type 1 (insulin-dependent) diabetic pregnancy and the occurrence of spontaneous abortion and fetal malformation in Sweden. *Diabetologia* 1990; **33**: 100–104.
3. Wickes JG. Fetal defects following insulin coma therapy in early pregnancy. *Br Med J* 1954; **II**: 1029–1030.
4. Smithberg M, Runner MN. Teratogenic effects of hypoglycemic treatments in inbred strains of mice. *Am J Anat* 1963; **113**: 479–489.
5. Hannah RS, Moore KL. Effects of fasting and insulin on skeletal development in rats. *Teratology* 1971; **4**: 135–140.
6. Sadler TW, Horton WE Jr. Effects of maternal diabetes on early embryogenesis: the role of insulin and insulin therapy. *Diabetes* 1983; **32**: 1070–1074.

#### Diabetic Muscle Infarction: a Difficult Diagnosis Suggested by Magnetic Resonance Imaging

We report the case of a 22-year-old woman with Type 1 diabetes mellitus of 6 years' duration and anorexia nervosa who was admitted to our unit because of hypoglycaemic coma. She had a bedsore of the right buttock, infected by enterococcus faecalis. Her diabetes was poorly

controlled (HbA<sub>1c</sub> 10 %) and was complicated by cardiac and gastrointestinal autonomic neuropathy, cardiac failure, and proliferative retinopathy. One morning, the patient awoke with pain in the right thigh which was swollen (maximal circumference of 41 cm, versus 38 cm on the left side). The calves were painless and Homans's sign was absent. The laboratory tests showed a C-reactive protein of 33 mg dl<sup>-1</sup> and a white-cell count of 12 000 mm<sup>-3</sup>. Creatine kinase levels were normal. The Doppler study of the right leg was normal. The pain worsened and a first MRI study of the right thigh suggested soft tissue infection on the basis of the hypersignal of the quadriceps muscle on T2-weighted images and diffuse enhancement on post-contrast T1 weighted images with central and focal dark areas. The evolution worsened and a second MRI scan revealed significant enlargement of the muscle with the same characteristics on T2-weighted images. On T1-weighted images after gadolinium injection (Figure 1), the unenhanced central core within the muscle appeared larger with a surrounding enhanced rim, mimicking a muscular abscess. However, linear enhanced signal infiltrates were present through the dark core. On clinical, biological and radiological basis, a pyomyositis was suspected and surgical intervention occurred. The surgeon did not find an abscess but necrotic tissue. The histologic examination showed necrotic myocytes without nuclei. The perimysium contained red cells. There was no evidence of vasculitis or microvessel angiopathy, and bacteriologic samples were negative.

Skeletal muscle infarction, firstly described in diabetes in 1965<sup>1</sup> is a rare complication of diabetes and may be misdiagnosed as a neoplasm, an abscess or myositis, as recently reported.<sup>2</sup> It occurs in patients with poorly controlled diabetes and with diabetic complications, as in our patient. The infarction has been suggested to result from ischaemia caused by arteriosclerosis and microangiopathy, although we did not find histological evidence of either in the present case. Creatine kinase levels may be normal or slightly elevated.<sup>2</sup> Our case illustrates that this difficult diagnosis must be considered in the face of a painful and tender swelling of a leg occurring abruptly in a diabetic patient. We also suggest that post-contrast T1-weighted MRI revealing the presence of enhanced linear signal infiltrates through an abscess-like lesion preserving the tissue planes may suggest diabetic infarction.

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## References

1. Angervall, L, Stener B. Tumoriform focal muscular degeneration in two diabetic patients. *Diabetologia* 1965; **1**: 39–42.
2. Scully RE, Mark EJ, McNeely WF, Ebeling SH, Phillips LD. Case Records of the Massachusetts General Hospital. A 54-year-old diabetic woman with pain and swelling of the leg. *N Engl J Med* 1997; **337**: 839–845.